INDEX.

The * Indicates that the Article is Illustrated with Engravings.

A

Accidents, prevention of.....82, *90
Acetylene fog horn.....272
Acre, how to lay off.....*464
Advertising with moving pictures...*536
Aerodynamic laboratory *445

AERONAUTICS.

—Across the Atlantic by aeroplane.*106
—Air craft in explorations.....397
—Atmospheric disturbances 42
—Blériot visits America.....415
—Brucker's expedition *243
—International Aeronautical Exhibition 355
—Moullard monument *271
—Muscle as motive power.....506
—Eiffel aerodynamic laboratory *445
—New York aero show.....*472
—Notes.....63, 83, 151, 191, 211, 233, 283, 303, 355, 395, 415, 471, 491, 511, 544
—Wright patent in Germany...191, 221, 287
—Wright, Wilbur 471, *518

AERONAUTICS, ACCESSORIES.

—Automatic parachute *311
—"Spiron" 63

AERONAUTICS, ACCIDENTS.

—Death of Lieut. Hazlehurst 558
—Death of Parmalee.....531
—Due to "holes in the air".....42, 56
—Recent accidents 151, 191, 471
—Reichette's fatal parachute fall...*178
—Fate of Andre.....415
—Rodgers' fatal accident.....*356

AERONAUTICS, EXHIBITIONS AND CONTESTS.

—Automobile vs. aeroplane.....*209, 211
—Height record with two passengers.355
—International aviation salon.....*68
—Miss Quimby's flight across the channel *492
—Monoplane speed record.....178
—Parislan "Aviette" contest.....*542
—Pekin-Paris conditions 491, 559
—Speed records in France.....151
—Tabuteau's records...303, 355, *397
—Vedrine's speed records...233, 191, 283
—Varriman-Seiberling Expedition ...*152

AERONAUTICS, MILITARY AND NAVAL.

—Across the Sahara.....325
—Aerial gun 350
—Aeroplane fleet for our army.....415
—Aeroplane machine gun 559
—Aeroplanes for German army.....491
—Bomb dropping in France.....491
—French dirigibles *84
—French equipment and plans.....233
—Italian-Turkish war ...151, 211, 283
—Military aviation 211
—Tests of new biplane.....303
—Transporting French aeroplanes...303
—U. S. requirements, for aeroplanes and aviators 298

AERONAUTICS, PRIZES.

—Aero club offer for cup defender...415
—Gould-Scientific American Prize... 87, 349, 448, 470, 486, 517, 540, 578
—Kaiser's prize for aeroplane motors.211

AERONAUTICS.

—See also Aeroplanes.—Balloons and Airships.—Hydro-aeroplanes.

AEROPLANES.

—Aerial taxicab *49
—"American," monoplane *472
—Automobile vs. aeroplane.....*209, 211
—Boland biplane *178
—Burgess-Wright military biplane..*472
—Deperdussin monoplane *398
—Designs of racing machines.....*398
—Difficulties in steering.....129, 215
—Electric guides 263
—Gallaudet racing monoplane.....*472
—Automobiles for hauling.....*12
—Gyroscopic action.....239, 399, 495
—Jacobs multiplane *472
—Marcay-Moonen monoplane ..*393, *397
—Mattullath patents 365, 451, 563
—Military biplane tests.....393
—Monoplane speed records.....178
—Morane-Saulnier monoplane..*397, *398
—New Blériot monoplane.....511
—New control *178
—Paulham-Tatin aerial torpedo.....*49
—Scientific American all-steel racer.*398
—Starting and alighting.....399
—Thrust of a propeller *567
—To cross the Atlantic.....*106
—Toy flying machines..... 72
—U. S. requirements.....298
—With folding wings *393, *397
—See also Aeronautics.—Hydro-aeroplanes.

African expedition, Rainey.....263

AGRICULTURE.

—Cottonseed, and its use 584
—Crop improvement 514
—Electro-culture of plants.....63, 437
—Grafting pecans on hickory.....143
—Growing Easter lilies.....319
—Increasing use of automobiles.....*133
—Many uses of electricity.....303
—Motor threshing machine.....*336
—Operation of traction engines.....*126
—Remedy against cochylis.....103
—Scientific methods of soiling.....*130
—Sewage plant for farm house.....*332
—Sub-soiling by explosives.....124
—Utilizing surplus potatoes.....232, 359
—See also Fertilizers.—Fruit.
"Akron"—Air ship *152
Alarm and indicator system.....221
Alkali destructive to cement.....102
Alligator farming *422
Animals, concealing-coloration *566
Animals, patents 558

ALUMINIUM.

—Diseases of 495
—Electrical uses *221
—Soldering by new alloy.....491
—Various uses 437
American Association for Advancement of Science 355
American Geographical Society, excursion 395
American Museum of Natural History *196

AMERICAN MUSEUM OF SAFETY.

—Prize for Marine life-saving.....425
—Prizes for safety devices.....82, *90
Ammunition, see Ordnance.
Amundsen, Roald *265
Andes, curious lightning in.....464
Anaesthesia, new process..... 7

ANTARCTIC EXPLORATIONS.

—Capt. Scott at the South Pole.....324
—Historical sketch 265
—Mawson expedition 306
—Present expeditions 45, 191, 511
—Polar malady 559
—Shadows at the South Pole *542
—South Pole discovery.....232, 265
Anti-corrosive treatment 554
Antimonite, photo-electric 194
Antiseptic surgery *173
"Antitrades" 49

ARCHAEOLOGY.

—Discoveries at Boscoreale.....323
—New discoveries at Pompei.....*420
—Reproducing Indian inscriptions...*91
Arithmetical "nut" 174 269, 583
Armor versus gun *442
Asphaltum 556

ASTRONOMY. 4

—Fluctuations in solar radiation.....166
—Heavens in February.....*110
March *198
April *290
May *402
June *498
July *585
—Interesting asteroid Vesta.....198
—Lunar mountains 498
—Morning an evening stars, 1912...*207
—Mount Wilson solar observatory, *156, *513
—New star in Gemini.....*290
—Solar corona due to pollen.....558
—Turret telescope *218
Athletes, use of oxygen.....302
Atlantis 141
Atmosphere. See Meteorology.
Atomic theory 286
Augustine, Benjamin F.....*312
Aurora, spectrum of.....526
Austin dam, cause of break..... 102
Australian trees 415
Automatic trumpeter *336

AUTOMOBILES.

—Aeroplane vs. automobile....*209, 211
—An early automobile.....542
—Armored motor vehicles *12, 50
—As a portable source of power.....448
—Burnt-gas exhaust for garage.....*111
—Curious motor sleighs *180
—Device for warming steering wheel.455
—Driving at night *18, 32
—Eight-wheeled *91
—Electric truck for switching cars..*311
—Emergency cars 578
—For fighting aerial craft.....*12
—For military purposes *12
—For road building *234
—Horses and automobiles, cost.....*561
—Light and heavy car cost..... 24
—Many uses on a farm.....*133
—Motor sledding at Saranac Lake...*217
—Motor threshing machine *326
—Motor truck cost charts..... 22
—New inventions needed.....*10
—N. Y. automobile show..... 62
—Riding qualities 7
—Relief jack *161
—Selection of motor trucks.....*5, 16, 31
—Scientific test of electric truck....*561
—Starting cranks, obsolete..... *8
—Street cleaning in Paris.....*361
—Suspending a motor car.....160
—Teamsters for chauffeurs..... 24
—The tire problem *26, 34
—Tire chain patent 96
—Varied uses of motor vehicles.....448
—Vienna auto fire engine.....*138
—Westinghouse air-spring *160

AUTOMOBILES, ACCESSSORIES.

—Acetylene generator tank.....*568
—Adjustable pedal *11
—Anti-kick starting crank.....*11
—Automobile starters *8
—Electrically heated gloves *568
—Fender *197
—Flywheel magneto *11
—Headlight turning device *568
—Headlights and lamps *18, 32
—Hydraulic tire-pump *423
—Kerosene vaporizer 568
—New inventions *10, *568
—Over-heat alarm *11
—Pneumatic tire armor *272
—Pump, power driven.....*11
—Shock-absorbers 7
—Test of mud-guards *235
—Tire pressure gage *11
—Wooden tire for motor trucks.....*271

AVIATORS.

—Brucker, Joseph *243
—Langley, S. P..... 53
—Parmalee, C. O.....531
—Wright, Wilbur 471, *518
—U. S. military qualifications.....298
Aztec sculpture *542

B

Rabbitt metal *71
Bacteria *333
Balanced rock pagoda.....*311
Balata, source and use 446

BALLOONS AND AIRSHIPS.

—"Akron" *152
—Brucker's air ship *243
—Highest sounding-balloon ascent.... 58
—Journey in a Zeppelin *580
—Loss of the "Parsival VII".....511
—Photography from a balloon.....*199
—Recent French dirigibles.....*84
—Vaniman-Seiberling expedition *152
—Wire-wound dirigible *152
—See also Aeronautics.—Aeroplanes.—Hydro-aeroplanes.

Banana cloth 151
Bank notes, destroying 238, *396
Bank notes, laundering *520
Bastian, Charlton 262

BATTERIES, STORAGE.

—Bifunctional formation of plates..520
—To cleanse plates 520
Beach subway and tunnel..150, *176, 259
Bean, castor 175
Beard, 11 feet long.....*311
Bell-making *231, 238
Berlin Museum of German industry..175
Berliner, Emil *52, 95

BIOLOGY.

—Bastian's theory 262
—Digestion of new-born infant.....494
—Dubois' "microbolds" 530
—Life from dead matter.....262
—Life of tissue outside of its organism.....461
—Life without bacteria.....*333
—Survey of Panama Canal Zone.... 63
—See also Medicine and Surgery.
—Relation of minerals to digestion..575
Biplanes. See also Aeroplanes.
Blasting with imperialite.....*493
Blériot, Louis, in America.....415
Blind, printing system *217
Blood as a weapon of defense.....387
Blowpipe, safe that resists.....*450

BOATS.

—Curtiss flying boat *137
—Experiments with model boat.....*136
—Hints for boatman *567
—Motor ice-boating *217
—New York motor boat show.....190
—Pleasure boats debt to the racer.*14, 30
—Soap-driven model 403
—See also Hydro-aeroplanes.—Steamboats and Ships.

Book-making exposition 415
Boring bar for bushings *71
Boscoreale 323
Bottles, non-refillable 96
Brahmaputra expedition 309
Breadmaking by electricity.....395
Breathing 284
Brooklyn Bridge *189, 195
Brucker, Joseph *243
Building trades, exhibition 595

BUILDING CONSTRUCTION.

—Fire towers 150
—Fireproof buildings 132
—Fireproofing 62
—Fires from bad construction..*529, *541
—Test of concrete theater.....*51
—Use of the cement gun.....*44
—Ventilator for Hotel Raleigh.....*403
Bushings, device for pulling.....*111
Butter from trees 175
Butter, test for fats and salts.....531

C

Calendars 350, 475
California, electrical transmissions..531
Cameras. See Photography.
Canadium 98
Canal, Monkland *479
Canal, trans-Cuban 490
Canaries as mine damp testers.....*138
Cancer, campaign against.....428
Cancer, research 282, 283
Car-seating problem 170, *172
Castor bean 175
Catalytic experiments 179
Cedar for pencils 386
Cellar switch *337

CEMENT AND CONCRETE.

—Alkali, a destroying agent.....102
—Concrete furniture *52
—Concrete ties on Panama Railroad.*200
—Plastering with a hose.....*44
—Sealing rock with granite.....*44
—Test of concrete theater.....*51
—Tunnel troubles 354
—Wire to reinforce pavements.....*403
Chauffeurs of teamsters..... 24

CHEMISTRY.

—Catalytic experiments 179
—Fats and salts in butter.....531
—Hydrogen-producing briquettes 463
—Influence of light upon ferments..194
—Sifter for laboratory *179
—National manufacturers' laboratory. 42
—New element, "Niton" 358
—Of what is a man?.....311
—Peroxide-hydrogen, made by sunlight 260
—Photo-electric automobile 194
—Simple fire extinguisher *179
—Spectometer, home made *383
—Sulphur in pyrites and pyrrhotite..179
—Tests of welds 171
—Welsbach, Carl Auer *327
Chestnut tree blight *241
Chicle from the zapote tree.....428
China, electro-plated *220, 263
Chuck, emergency two-jaw *111
Chucks, magnetic 471
Circular track of lost persons.....302
Clamp for screening doors.....*423
Clay-eaters 506

CLOCKS.

—Electrically driven 103, *219
—Notre Dame Cathedral clock.....*403
—Short alarms *92
Cloth. See Textiles.
Coal dealer's scales *91
Coal tar 534
Coast Defense. See Naval Affairs, Ordnance.
Cochylis 103
Coffee-pot, overflowing *479
Cohendy, Michael *333
Coin change machine *200
Coins, bought by mint.....286
Coleman du Pont highway.....*244
Columbia University *326
Commerce, Chambers of 299
Commercial high schools 66
Concrete. See Cement and Concrete.

CONGRESSES.

—American Road Congress.....574
—Geological Society of America..... 46
—International Congress of Chambers of Commerce 299
—International Electrotechnical Commission 515
—International Navigation Congress, 204, 437
Conservation of human life.....82, *90
Conveyors for kegs.....*138
Cottonseed and its uses 584
Crocker, Francis Bacon *43
Crocker Land 122
Crop improvement 514
Cuba, canal across 490
Cylinder bushing, boring bar.....*71

D

Dairy problems in the tropics.....558
Dam, Austin 102
Dam, Klingenberg *492
Dates, artificially ripened *512
Davis, Cleland 350
Deaf mutes *72
Delaware highway *244
Dental inlay patent 180, 201
De Quervain's expedition 492
Diamonds from illuminating gas.....*478
Dictographs *284
Diesel, Rudolf *357
Diesel engines ..170, 191, 233, *357, *500
Digestion, effect of minerals.....575
Digestion of infant 494
Disk, centering *71
Door frame, method of clamping....*111
Drafting pencil, three lined.....*567
Dredge, suction *489, 494
Drills for screws and taps.....*111
Drydock—Brooklyn yards 151, *473
Dust, counting grains.....*497

E

Earth-eaters 506
Ear protectors *219
Earthquakes. See Seismology.
East River, opening.....190, *379, 437
Easter lilies 319
Echoes, vagaries of 69
Edison, Thomas A.....*52

EDUCATION.

—Electric treatment for backward children *334
—German industrial 66, *193
—Gift to Mass. Inst. of Technology.*289
—Household arts at Columbia University *325
—Montessori methods 470, *564
—Need of technical schools.....202, 314
—Of railroad men.....*158
—Rousseau institute 355
—Salaries of instructors.....395
—See also Technical Training.
Egg, double *199
Egyptian incubators 437
Ehrlich Wassermann, cancer researches 282, 283
Eiffel, Gustave *445
Eiffel time signals 437
Eiffel Tower. 49

ELECTRIC APPARATUS AND APPLIANCES.

—Automobile starters *8
—Bell ringing transformer.....*383
—Drive for loom 437
—Electric clocks 103, *219
—Electric furnace *291
—Electric steel furnace.....437
—Fire-damp alarm *161
—Fireless cooker *336
—For removing oil from water.....*450
—Heater for water tank..... 437
—Heating in Norway.....171, 396
—Live wire detector *199
—Machines for bread making.....395
—Motor scrubbing machine.....*161

ELECTRIC LIGHTING.

—Automatic cellar switch.....*337
—On railroad trains 151
—Metallic filament for lamps.....*327
—Tungsten lamp patents *364

ELECTRIC RAILROADS.

—Car-seating problem 170, *172
—Improved tram-car designs.. 47, *336, 415, 491
—Grinding rails at welded joints....*479
—Reliability of single-phase system.375
—Trailers in Pittsburgh *172
—See also Railroads.—Subways.

ELECTRICITY.

—Applications in coast defense.....395
—Automatic control of rotary converter 395
—Cost of different installations.....375
—Damage to sub-surface metallic structures 511
—Electrified children *334
—Electro-culture of plants.....63, 437
—Handy series current tap *423
—Heating an office building..... 471
—Hydro-electric plant 171
—International Electrotechnical Commission 515
—In the U. S. Printing Office.....531
—Maintaining constant level 170
—Many uses on the farm.....303
—Mercury vapor rectifier 278
—Molten glass as a conductor.....512
—Notes.....47, 63, 83, 103, 125, 171 211, 233, 263, 283, 303, 325, 375, 471, 511, 531
—140,000-volt transformers 211
—Plowed field as line conductor.....511
—Simple resister *111
—Storage battery plates.....520
—Thawing water pipes 233, *269
—Thermomagnetic motor *519
—To rid piling of the tiredo pest....*403
—Transmissions in California.....531
—Use of aluminum.....221
Electron theory 286

ELECTROPLATING.

—Metals, china and wood 220, 263
—Nickel 125
Elephants, cleansed of paint.....*311

ENGINEERING.

—Cement troubles in tunnels.....354
—Controlling water waste.....302, *304
—Dredging Mississippi river.....*489, 494
—Engineers in manufacturing.....314
—Galveston causeway *581
—Jungfrau tunnel *285
—Montmartre hill tunnel *86
—Notes.....47, 103, 125, 151, 171, 191, 211, 233, 263, 325, 355, 375, 495
—Romance of 124
—Shall my boy become an engineer 202, 314, 408, 504
—Water sterilizing plant *268
—Weston, Edward *312
Elevators, safety device 293
Elevators, subway *89

ENGINES.

—New rotary engine *312
—Superheated steam engines, 102, *213, 595
—Traction engine for farm.....*126
Engravings, reproducing 519
Equitable Building fire 62
Ericsson, John *153
Eskimos as inventors 221
Eskimos of Victoria Land..... 43
Esperanto 96
Engines 324
Evolution, Johannsen's theories of...*310
Exercising in bed *512
Exhaust for a garage *111
Explorations in air craft.....397
Explosives for sub-soiling 124
Explosive, safety *493

F

"Fata Morgana" 335
Fatigue, eliminating mental.....397
Federal control of water power.....232
Ferments, effected by light.....194

FERTILIZERS.

—By-product of packing houses.....*538
—Mixing materials *130
—Peruvian guano 530

FIRES AND FIRE SERVICE.

Automobile fire engine..... 96
—Co-operative fire protection 572
—Fire exposition 592
—Fire alarm and indicator.....221
—Fire towers 156
—Fire waste and prevention..... 132
—Fire waste of the U. S. *529, *541
—Home-made extinguisher *179, 307
—Improving fire departments.....132
—Lessons of Equitable fire 62
—Matches and fire 486
—Preventing forest fires.....*48
—Storing inflammable liquids.....*416
—Vienna auto fire engine.....*138
Fire damp *138
Fireless cooker, electric *236
Fireproof Construction. See Building Construction.

FISH AND FISHERIES.

—Fish culture in Germany.....*533
—Memory of fish.....471
—Phosphorescent bait 395
—Phosphorescent fish 512
—Sleeping fish 137
—Temperature and color of fish.....138
Florida, U. S. Battleship *308
Flowers, metal *219
Fog horn, acetylene 272

FORESTRY.

—Bulletin on oak woods.....303
—Cabole tree 444
—Canadian conservation 191
—Commercial woods 226
—Chestnut tree blight 105, *241
—Forest bill 302, 495
—Introducion of Nammu tree 474
—North American gum woods.....527
—Panama hat palm 494
—Patent for healing tree wounds....521
—Preventing fires *48
—Tall trees in Australia.....*15
—Time to cut timber 185
—Trees that yield butter.....175
—Utilizing waste timber *537
—Willard tree freak *271
—Zapote tree a source of chicle.....428
Formic acid 574
"Forty-pound horse collar".....227
Fountain pen with windows 293
Fourth dimension 214
Frost flowers *64
"Froude," model boat *136

FRUIT.

—Fruit trees by roadsides 82
—Orchard heaters *135
—Peach tree freak 199
—Ripening dates artificially.....*512

FUEL.

—Coal dealer's scales.....*91
—From Nile river sudd..... 84
—Problems in saving *539
Fume-condensing 53
Furnace, electric *291
Furniture, concrete *52
Furniture "revivers" 154

G

Gages, surface *71
Galveston (Tex.) causeway.....*581
Garage, exhaust *111

GAS.

—Bottled for home use 415, 471
—Diamonds from illuminating gas...*478
—Devices for cooking *323
—Gretzine gas burners 350
—Incandescent light mantle *227
—Manipulation of mantles.....255
—Precious stones from waste 562
—Utilization of waste gas 534
Gas Engines. See Internal Combustion Engines.
Gasoline can, safety device.....*161

GEOLOGY.

—Blowing and sucking wells.....242
—Cause of glacial period..... 63
—Geological Society of America..... 46

GERMANY.

—Battle cruiser "Moltke".....*560, 578
—Commercial high schools..... 66
—Industrial conditions.66, 134, *193, 534
—Labor question 134
—Museum of Industry 175
—Number of physicians 98
—Waste utilization 562
Glacial period 63
Glass, electro-plated *220, 263
Glass labels *92
Glue, tests for quality 556
Goitre, experiments 260

GOULD-SCIENTIFIC AMERICAN PRIZE.

—Arrangements for contest.....540, 578
—Entries for 518, 540
—Rules governing..87, 349, 448, 470, 486
Gravity, force of, measured *104
Great Eastern and Titanic.....414, *417
Greenland expeditions.....103, 375, 492
Grills, gas heated.....*323
Grinding wheels, making.....270
Grinding wheel tests *271
Guana, Peruvian 530
Guns for placing cement.....*44
Gum woods 527
Guns and Gun-powder. See Ordnance.
Guyer-Zeller, Adolf *285
Gymnastics, training for nerves.....479
Gyro-compass 382, *588

H

Hail storms, protection against.....584
Hawke-Olympic collision.....170, 215, 239
Heating devices, Norway.....171, 396
Heavens. See Astronomy.
Heroism of medical men.....164
Herschel, Sir William 572
"Holzapfel I" *50
Home laboratory, *92, *179, *291, *383, *519
Horse collar, metal.....227

HOUSEHOLD ARTS.

—At Columbia University.....*326
—Electric fireless cooker.....*336
—Housekeeping experiment station..*350
—Kitchen conveniences *542
—Motion study in household..... 328
Huneke-Martini apparatus *416
Hydraulic cartridge *364
Hydraulic shield *176

HYDRO-AEROPLANES.

—Contest at Monaco.....151
—Curtiss flying boat *137
—Meeting at Monaco.....*356
—New York motor boat show.....190
—Queen aero boat.....*472
—Robinson's accident *219
Hydro-electric plants. See Water Power.
Hydrogenite 463

I

Icebergs *377
Ice boats, motor *217
Illusion, light and shade.....*519
Imagination in science..... 6
"Imperialite" *493
"Imperator," rudder post.....*479
Incubators, Egyptian 437
Indian heads cast from life.....*196
Indian inscriptions *91
Indian sea, light phenomena.....*51
Indicator and alarm system.....221
Industrial conditions, Germany, 63, 134, *193, 534
Infant, digestive powers.....494
Insects. See Natural History.
Inscriptions, Indian *91
Insurance, industrial 134, 351

INTERNAL COMBUSTION ENGINES.

—Cooling device 95
—Diesel engine..170, 191, 233, *357, *500
—For motor-boats *14, 30
—Internal combustion turbine.....*543
—Jenkins starting device.....501
—Marine producer-gas *50
—Motor ship "Selandia".....*264
—Removing from automobiles.....*17

INVENTIONS.

—Automobile accessories *10, 28
—Brief notes.....63, 95, 180, 201, 249 293, 340, 365, 385, 480, 520, 543 568, 569
—Use of aluminium 221
—Gift to the public.....365
—Little things that make big inventions 452
—Military inventions 452
—Need of excavating apparatus..... 53
—Red Cross Society prizes..... 59
—$7,500 for a non-slipping rubber....273
—Simplicity a merit.....160
—Would-be and the actual inventor.455
—See also Patents.

INVENTORS.

—Croker, Francis Bacon.....*43
—Esquimau as an inventor.....221
—Inventors' Guild 160, 210
—Jenkins, C. F.....*292
—Jorgensen, J. C..... 72
—Notes...52, 72, 112, 160, 180, 200, 220 272, 292, 312, 338, 364, 384, 521, 544
—Prizes for 382
—Westinghouse, George 577, 582
—Women as inventors.....*338
Ireland—ancient oratory *138
Iron, non-corrodible coatings...325, 554
Iron waste, briquettes *477
Irrigation in Luzon.....*108

J

Jack, automobile *161
Jenkins, C. Francis.....*292

Johannsen, Wilhelm *310
Jorgensen, J. C. *72
Jungfrau tunnel 285

K

Kegs, conveyors *138
Keys, suggestions for *543
Key West Railroad 102
Kinemacolor processes *76, 287
Kitchen work lightened *542
Klingenberg dam *492
Kola nut 137
Kubus of Sumatra 125

L

Labels, glass *92
Labor question 134
Laboratory for manufacturers 42
Laboratory labels *92
Laboratory lifter *179
Lackawanna Railroad 6
Lactic acid 574
Langley, Samuel Pierpont 53
Laryngoscope *72
Lead burning 533
Lemon, "chicken-foot" *51
Lead sulphate, to remove from plates.520
Lemons, "chicken-foot" *51
Lenses with plane surfaces 283
Life, artificial 530
Lifeboats. See Steamboats and Ships.
Life from dead matter 262
Life of tissue outside of its organism.461
Life rings *219
Life-saving device (at sea) 425
Life without bacteria *332
Lifter for laboratory *179
Light and shade illusion *519
Light, influence on ferments 195
Light phenomena of Indian Sea *51
Lighthouse, oldest 155
Lightning and telephone wires 47
Lightning arrester, largest *479
Lightning in the Andes 464
Lightning, new ideas *584, *586
Lilies, Easter 319
Linden Museum 266
Liquids, inflammable, storing *416
Liquids in tanks, weighing *478
Lister, Joseph *173
Live wire detector *199
Locomobile *213
Locomotives. See Railroads.
Lohmann's non-corrodible coating 554
Longevity and sour milk 65
Los Angeles aqueduct *171, *469, 476
Lost persons 302
"Lusitania's" bridge *271
Luzon, irrigation *108

M

Magnetic chucks 471
Magnetos, flywheel *11
"MAINE."
—Burial at sea *281, *288
—Disposal of memorials 103
—Explosion explained *85
"Making the machine sew" 256
Malladra, Alessandro *532
Man, chemical view of 311
Manholes, sinkable *424
Map for the blind *217
Marathon races 302
Marine exploration *169, 174
Martians 262
Massachusetts Institute of Technology *136, *263, 289
Matches and fires 486
Mattullath patents 365, 451, 563
"Mauretania" *417
Meat industry, by-products *538
MEDICINE AND SURGERY.
—Anaesthesia, new process 7
—Apparatus for exercising in bed..*512
—Apparatus for thoracic operations..112
—Artificial mountain air *197
—Artificial snow in skin treatment..387
—Campaign against cancer 428
—Church, eugenics and immigration.324
—Curative powers of "Niton" 358
—Digestion of new-born infant 494
—Effect of exercise on the heart *512
—Eliminating mental fatigue 297
—Father of antiseptic surgery *173
—Goitre 260
—Grafting a cornea on a blind eye..355
—Heroism of medical men 164
—Immunity against poisons 478
—Japanese treatment of syncope 196
—Lister, Joseph Baron *173
—Physicians in Germany 98
—Polar malady 559
—Prizes for inventions 59
—Radium spa 256
—Reduction of arterial pressure *334
—Wasserman-Ehrlich researches 282
—Wourahli poison preparation 258
—See also Biology.
Melville, George W. 282
Mental fatigue overcome 397
MERCHANT MARINE.
—Large exports should bring 67
—National issue 210, 359, 379
—Plan to revive 129
Mercury vapor rectifier 278
Metal flowers *219
METALLURGY.
—Canadium 98
—Lohmann's process for non-corrosion.554
—Non-corrodible metal coatings 325
—Use of moving pictures in tests 394
—Vanadium steel 118
—See also Aluminum.—Steel.
Metals, testing for hardness *71
Metal waste made into briquettes ..*477
METEOROLOGY.
—Abnormal summer of 1911 306
—At St. Louis University 437
—Curious light phenomena *51
—Drought in tropical America 375
—Dust storms *497
—Great storm of 1703 155
—Hailstorms, protection against *584
—Highest balloon ascent 58
—"Holes in the air" 42, 56
—Lightning *584, 586
—Lightning in the Andes 464
—Mares' nests in phenomena 530
—Mirages of Calabrian coast *335
—Night storm signals 309
—Phenomena in Chesapeake Bay 399
—Plans for Greenland expedition 492
—Service of South Africa 471
—Spectrum of the aurora 526
—Rainbows 305
—Rotch, Abbott Lawrence 354, *376
—Spectrum of the aurora 526
—Trade-winds 49
—Thunder, distance heard 77
—Wireless weather reports 49
—World tour of inspection 105
Mexican serpent head *542
Microbioids 530
Microscope stands *291
Milan's water supply 137
MILITARY ART AND SCIENCE.
—Coast defense of U. S. 436, *438, 440
—Military inventions 452
—Subsidizing motor vehicles *12
—See also Aeronautics, Military and Naval.—Ordnance.
Milk, modified 171
Milking machine *112
Milling machine from planer *270
Mimeograph, rotary 262, 273, 287, 307, 329, 339, 359
MINES AND MINING.
—Canaries for detecting fire-damp..*138
—Fire-damp alarm *161
—Freezing water in shaft 125
—Hydraulic cartridge *364
Mines, submarine *444
Mirages of Calabrian coast *335
Mississippi River, dikes 475
Mississippi River, dredging *489, 494
Mississippi River floods 255, 495
Mississippi valley, drainage 495
Money, paper, destroying 238, *396
Money, paper, laundering *520
Monitor of 1862 ....*153
Monkland canal *479
Monoplanes. See Aeroplanes.
Montessori, Maria 470, *564
Mop wringer *384
Motion study in household 328
MOTOR CYCLES.
—Novel automobile bicycle *51
—Improvements of 1912 ....*19
Motor, thermo-magnetic *519
Mouillard, Louis Pierre *271
Mt. Wilson, "Old Man" of *403
Mount Wilson Observatory *156, *513
Mountain air, artificial *197
MOVING PICTURES.
—At home *273
—Colors reproduced *70
—For school use 471
—Industrial uses *536
—Use of glass plates *477
—Use in scientific study 394
Mushrooms, poisonous 159

N

Nammu tree 474
Narwhal tusks *51
NATURAL HISTORY.
—Alligator farming *422
—Blood, weapon in insects 387
—Cochylis 103
—Concealing-coloration in animals ..*566
—Elephant seals *138
—Fish, memory of 471
—Light of the piddock 102
—Luminosity of deep-sea creatures..512
—Marine explorations *169, 174
—Narwhal tusks *51
—Rainey African expedition 263
—Titanothere *301, 315
NAVAL AFFAIRS.
—Battle-cruisers for U. S. Navy 578
—Battle-cruisers for our navy 6
—Brooklyn navy yard drydock..151, *473
—Chain of wireless stations *360
—Coast defenses of the U. S. 436, *438
—Death of Admiral Melville 282
—East River channel 190, *379, 437
—Electricity in coast defenses 395
—House appropriation bill 510
—Increase in world's fleets 296
—Increase the U. S. coast artillery.436
—Necessity of maintaining standard.124
—Retrenchment a peril to U. S. 490
—Submarine mines in coast defense.*444
—See also Aeronautics, Military and Naval.—Ordnance.
Navigation and Eiffel time signals ..437
Navigation, International Congress, 204, 437
Navigation in northern waters 558
Nerve training by gymnastics 479
"Nevada," U. S. battleship *85, *212
NEW YORK (CITY).
—Aero show *472
—Automobile show 62
—Beach subway (1866) 150, *176, 359
—City Hall Park 82, *189, 195, 490
—Motor boat show 190
—Opening East River 190, *379, 437
—Opening of naval drydock *473
New York (State) water power 151
Nile River sudd 84
"Niton" 358
Non-corrodible coatings 325, 554
Norton Company *90
Nuts, kola 137
Nuts, pecans 143

O

Ocean surf shakes the earth 558
Oak woods, bulletin 320
Observatories. See Astronomy.
Occupations, unusual 462
Oil Engines. See Internal Combustion Engines.
Oil from water, removing 450
Oil heaters for orchards *135
Oil paintings, renovating 151
"Oklahoma," U. S. battleship ..*85, *212
"Old Man" of Mount Wilson *403
Oleomargarine, manufacture *192
Optical phenomena of rainbows *305
Optics, atmospheric 530
Orange, gourd-shape *51
Oratory of Gallerus *138
Orchard heaters *135
ORDNANCE.
—Aerial gun 350
—Aeroplane machine gun 559
—Coast defense batteries 438
—Concealed battery of coast defense.*441
—Double report in gun fire 67, 187
—Ear protectors for gunners *219
—Guns of the coast defense *440
—Guns versus armor *442
—"Imperiolite," safety explosive..*493
—Range-finding tower *438
—Self-scoring target *159
—Smokeless powder 358
—Three-gun turrets *85
—Vickers automatic gun *109
Oxygen for athletes 302
Ozone sterilization 490

P

Pacinotti, Y. 374
Packing house by-products *538
Pagoda on balanced rock *311
Paintings at Pompeii *420
Palm, Panama hat 494
PANAMA CANAL.
—Biological survey of zone 62
—"Human interest" 210
—Question of tolls 82, 150
—Personal impressions 353, *363, *516
—Effect on steamship routes 104, 151
—Senator Bristow's bill 150
—Slides in the Culebra cut 233, *516
Panama hat palm 494
Panama Railroad, concrete ties *200
Paper money, destroying 238, *396
Parachutes. See Aeronautics, Accessories.
Paris aero show *68
Paris—electricity from Rhone 47
Paris—subway *86, 283
Parmalee, C. O. 531
Parsons, Hinsdill 425
Parsons, Sir Charles 124
PATENT OFFICE.
—A separate department 425
—Court of patent appeals 201
—Improved classification 481
—In the good old days 220
—Report of commissioner 200
PATENTS.
—Addition is not invention 425
—Bankrupt owners of applications..481
—Berliner talking machine *52, 95
—Bills now before Congress 394
—British patents and application 521
—Commission recommended 470
—Compulsory license question 414
—Court discusses aggregation 481
—Cottrell fume-condensing 53
—Danger of delays 250
—Decision on process patents 251
—Dedicated to the public 112
—Dental inlay patent 180, 201
—Disclosure of trade secrets 73
—Efforts to reform patent system..210
—Expiring this year 480
—For plants and animals 558
—Foreign trade-mark registration 251
—Guarantee to secure patents 73
—Hearing on the Patent Bill 405
—Importance of prompt filing 365
—Legal notes 96
180, 201, 250, 274, 341, 481, 521, 544
—Maintaining prices on patented articles 501
—Marking devices "patented" 251
—Mattullath aeroplane patents, 365, 451, 563
—Oldfield patent bill 535
—Patent assignments 96
—Plea for new patent laws 100
—President recommends a commission 470
—Price restrictions 341
—Proposed legislation 385
—Reduction to practice 521
—Rotary gear pump *384
—Rotary mimeograph case, 262, 273, 287, 307, 329, 339, 359
—Secrecy of inventions 340
—Selden case 307, 569
—Sherman anti-trust law 436
—Similarity of mark, tending to deceive 251
—Tire chain 96
—Trade mark development 569
—Tungsten lamps 364
—Use of patented invention 162
—U. S. must pay for infringement ..481
—Wright and Mattullath 563
—Wright patent in Germany, 191, 221, 287
—See also Inventions.—Patent Office.
Peach tree freak 199
Pecans grafted on hickory 143
Pencil, three-line drafting *567
Pencil cedar, substitute 386
Pennsylvania Railroad 325
Phenomenon in Chesapeake Bay 399
Peroxide-hydrogen made by sun rays.260
Petroleum in Turkestan 191
"Petropavlovsk" 278
PHONOGRAPHS.
—Automatic record-stop 404
—Dictating machine *284
—Edison recording stylus 481
—New optical phonograph *382, 535
Photo-electric automonite 394
"Photogrammetric gun" *123
PHOTOGRAPHY.
—Bettini apparatus for moving pictures *477
—Color photography 63, 142, 287
—Distortions, real and faked *309
—From a balloon *123, *199
—125-foot tripod *199
—Sculpturing with the camera *496
—Transmission over telephone wires.*493
Physicians in Germany 98
PHYSICS.
—New notions of matter 286
—Passing of Pacinnotti 374
—Principle of Relativity 525
—Road building experiment station.. 47
Piano-player with violin *216
Piddock, light of 102
Pitometer *594
Plants, patents for 558
Planer converted into milling machine *270
Pneumatic automobile starter *8
Poison in mushrooms 159
Poisons, immunity against 478
Poison, Wourahli 258
Police telephone 250
Pollen causes solar corona 558
Pompeii, paintings discovered *420
Pontoon method of life saving, *413, *418, 585
Port Sudan 47, 324
Postage stamps, abolishment 67
Postage stamps, printing 238
Postal service on subways 262
Potatoes, drying 232, 359
Prick punch, double-pointed *423
Principle of relativity 525
Printing, electric appliances 531
Printing for the blind *217
Producer-gas engine *50
Propeller, measuring thrust *567
Pump, automobile *11
Pump, rotary gear *384
Pump, tire *423
Punch, prick, double-pointed *423
Pure Food and Drugs Act 282
Pyrites 179
Pyrrhotite 179

Q

Quimby, Miss Harriet *492

R

Radiographic study of the heart *512
RADIUM.
—Austrian monopoly 429
—"Radium Emanatorium" 171
—Spa in Bohemia 256
Rail-grinding machine *479
RAILROADS.
—Advantages of steel cars *105
—African railway projects 47
—American railroads in Uruguay 376
—Battery locomotives 103
—Concrete ties on Panama R. R. *200
—Electric switching truck *311
—Electrifying at small expense 471
—Fast track laying 211, 329, 419
—Floating trains *292
—Florida East Coast 102
—Gas-electric car 415
—Government road in Alaska 325
—Jungfrau railway tunnel 233, *285
—Locomotive curiosities 107
—Nord-Sud Railway *86
—Pennsylvania Railroad 325
—Peril of the steel rail 190
—Prevention of accidents 82
—Railroad economy 211
—Reduction of grades 6
—South American Transcontinental R. R. *88
—Steel cars safer *105
—Superheated steam locomotives 595
—Telephones for announcing trains..325
—Train dispatching by telephone 395
—Train-lighting instruction car 151
—Training railroad men *158
—Trans-Andine railways 154
—Vacuum cleaner for cars *161
Rainbows *305
Rainey African expedition 263
Range finding tower *438
Ranges, gas-heated *323
Rectifier, mercury vapor 278
Red Cross Society prizes 59
Relativity, principle 525
Resister, electric *111
Rhinoceros, ancestor of *301, 315
Rhone river, power from 47
Rice terraces *108
ROADS AND ROADMAKING.
—"A stitch in time—" 470
—American Road Congress 574
—Bills before legislatures 240
—Coleman du Pont highway *244
—Experiment station 47
—Federal assistance *236
—How to build good roads *236
—Maintenance necessary 414
—Object lessons 232
—Reinforced concrete pavements *403
—Transcontinental highway 535
—Use of auto in roadmaking *234
Rodgers, Calbraith P. *356
Rotary gear pump *384
Rotch, Abbott Lawrence *354, 376
Rome, a seaport 263
Rousseau Institute 355
Rubber substitutes for tires *26
Rumsey's steamboat 73
Ruins, Irish *138
Russia's seismological service 177

S

Sahara Railway 375
Sailors' Unions 447
Safe, that resists the blowpipe *450
Safety device for gasoline can *161
Safety device for grinding wheel *90
Safety devices, medal for 82, *90
SANITARY ENGINEERING.
—Power from sewage 562
—Private sewage disposal plant *332
—Sewer cleaning device *543
—Sinkable manholes for pipe sewers.*424
—Smoke and soot in the air 46
—Street cleaning automobiles *361
—Tricycle street sweeper *479
—Saranac Lake, sledding *217
—See also Water Supply.
Scales, coal *91
SCIENCE.
—American Association for the Advancement 63
—Heroisms of medical men 164
—Human side of great scientists 530
—Life without bacteria *333
—Marine exploration *169, 174
—Moving pictures in scientific study..394
—Nationalism and internationalism..324
—Notes, 47, 63, 83, 103, 125, 151, 171, 191, 263, 283, 303, 325, 355, 375 471, 511, 531.
—Pioneer work 50
—Publication of Herschel papers 572
—Rotch, Abbott Lawrence 354
—Science in a passion 282
—Scientific terms 150
—Value of imagination 6
—Weisbach, Carl Auer *367
SCIENTIFIC AMERICAN.
—All steel racing monoplane *398
—Appreciation of the discussion of "Titanic" disaster 485
—Gould Scientific American prize.
—Rules governing 87, 349, 486
—Entries 518, 540
—Arrangements for contest 540, 578
—Medal for the conservation of human life and limb 82, *90
SCIENTIFIC MANAGEMENT.
—Domestic engineering *330
—In the improvement of crops 514
—Motion study in household 328
—Railroad economy 211
Screening doors, clamp *423
Screw, to extract *567
Screws, device for holding *71
Screws, size drills *111
Scrubbing machine, electric *161
Sculpturing with the camera *496
Sea exploration *169, 174
Seals, elephant *138
Searchlight, movable *438
Searchlights on ocean liners 399, 419
Sea-wall repaired with cement *45
Selberling - Vaniman Trans - Atlantic Expedition *152
SEISMOLOGY.
—At St. Louis University 437
—Earthquakes from wind 558
—In Russia 177
—Malladra's descent into Vesuvius..*532
—Predicting earthquakes 511
"Sclandia" *264
Selden patent case 307, 569
Seltzer water, dangers 286
Sensation, mechanically illustrated ..365
Senses, lying 358
Serpent bead excavated in Mexico *542
Sewage disposal for country home ..*332
Sewing machine, invention 256
Shade and light illusion *519
Shall my boy become an engineer 202, 314, 408, 504
"Sinking of the Petropavlovsk" 278
Skin treatment 387
SLEDS AND SLEIGHTS.
—Motor sleds at Saranac *217
—Motor sleighs in Europe *180
—Motor bob-sled *271
Smoke and soot in the air 46
Smoke prevention 285, *539
Smudge pots *135
Smelling gas 415, 471
Snow, artificial 387
Snow crystals *64
Snow garlands *91
Snow melters 191
Soda, manufacture 562
Solar radiation 166
Sour milk and longevity 65
South American railroad *88
Spading machine 113
Spangler, Henry W. 283
Spectrometer, home-made *383
Standpipe failure 171
STEAMBOATS AND SHIPS.
—Activity in building 233
—Automatic life rings *219
—Bridge of "Lusitania" *271
—Electrical sea pilot 521
—Experiments in ship construction..*136
—Growth in size of turbine 171
—International Congress of Navigation 204
—Launching life-rafts *501
—Life boats, improved davits *480
—Marine Diesel engine, two-cyle *500
—Means for launching life-boats *404
—Motor liner, "Selandia" *264, 355
—Nesting lifeboats 419, 437
—Northern steamship routes 558
—"Olympic"-"Hawke" 170, 171, 215, 239
—Perils of the deck-load *308
—Pontoon plan *413, *418, 585
—Prize for life saving device 425
—Rudder post of "Imperator" *479
—Rumsey's steamboat 73
—Safety at sea 436
—Searchlights on ocean liners 399, 419
—Sir William White, naval architect.*499
—The "unsinkable ship" *417
—See also War ships.
STEEL.
—Electric furnace 437
—Endless belting 261
—Industry and smoke 285
—Lead-coated 499
—Non-corrodible metal coating 325, 554
—Rails 190
—Railway cars *105
—To restore when burnt 71
—Vanadium 118
—Welding tests 171
Steinmetz, Charles P. 370
Sterilization, ozone 490
Storms. See Meteorology.
Street cleaning automobiles *361
Street sweeper, tricycle *479
Storage batteries. See Batteries, Storage.
Submarine mines in coast defense ..*444
Submarine power cable 171
Submarine. See Warships.
SUBWAYS.
—Car-seating problem 47, 170, *172
—First built by A. E. Beach, 150, *176, 359
—For postal service 262
—Paris *86, 283
—Ozonized air for 47, 180
Suction dredge *489, 494
Sudan, Port 324
Sudd, Nile 84
Sugar bowl, mechanical *272
Sugar, uses of 486
Surface gage *71
Surgery. See Medicine and Surgery.
Surveying a square acre *464
Surveying in a balloon *123
Syncope 196

T

Talking machine, Berliner's *52, 95
Tank, to prevent bursting *71
Taps, size drills *111
Target, self-scoring *159
Taxicab, aerial *49
Technical Museum of Vienna 286
TECHNICAL TRAINING.
—Donation to Mass. Inst. of Technology *289
—For railroad men *158
—German systems 66, *193
—Household arts at Columbia University *325
—Need of engineers 314
—Present day need 202, 314
—See also Education.
TELEPHONY.
—Dictographs *284
—Loud speaking annunciator 325
—Police telephones 250
—Service in New York and Paris 263
—Telephones for taxicabs 171
—Train dispatching 395
—Transmission of photographs *493
—Vestpocket transmitter *112
Telescope, at small cost *519
Telescope, turret *218
Telescopes, Mount Wilson observatory, *156, *513
Ten stories 205, 227, 256, 278, 370
Teredo destroyed by electricity *403
TEXTILES.
—Banana cloth 151
—Cloth from wood 862
—Electric drive for loom 437
—Treatment of woolen fabrics 125
Theater, test of strength *51
Thermo-magnetic motor and generator *519
Thunder-distance heard 77
Timber, time to cut 185
Timber, waste *537
Time signals by wireless 65
Timer, audible *92
Tire pump, hydraulic *423
Tires, substitutes for rubber *26
Tire, wooden *271
"TITANIC."
—Answers to correspondents 436
—Appreciation of Scientific American discussion 485
—Comments by correspondents..399, 419
—Compared with Great Eastern 414, *417
—Description of wreck *380
—Lessons of the disaster 374
—Light out of a dark tragedy 374
—Original plan for life boats *404
—Protection against flooding *417
—Senate committee's report 510
—Senate investigation 394
—Sunk to the bottom 374
—Tribute to the engineers 394
Tools, use and misuse *270, *337
Torpedo monoplane *49
Toys, mechanical *400
Track laying, rapid 211, 329, 419
"Tractioneer" *126
Trade marks, assignment of 96
Trade mark developments 569
Trade-winds 49
Train built of lemons and oranges *403
Transformer, bell-ringing *383
Trees. See Forestry.
Trucks, motor. See Automobiles.
Trumpeter, automatic *336
Tsangpo-Brahmaputra question 309
Tubing, sawed at angle *367
Tungsten lamp *364
TUNNELS.
—Cement disintegration 354
—Jungfrau *285
—Under Montmartre Hill *82, *86
TURBINES.
—Growth in size 171
—Herring-bone spiral *364
—Increased efficiency 151
—Internal combustion turbine *543
—Parson's turbine 95, 124
—Review of development 124
Typewriter, syllable *424

U

U. S. Army. See Aeronautics, Military and Naval.—Military Art and Science.
U. S. Bureau of Chemistry 282
U. S. Bureau of Printing and Engraving 238
U. S. Navy. See Aeronautics, Military and Naval.—Naval Affairs.
U. S. Printing Office 531

V

Vacuum aparatus *92
Vacuum bottle 249
Vacuum cleaner for railroads *161
Valveless engine *72
Vanadium steel 118
Vaniman-Selberling Trans-Atlantic Expedition *152
Varnish for furniture 154
Varnish, removing 151
Ventilator, largest *403
Vesuvius, exploration *532
Vicker's automatic gun *109
Vienna Technical Museum 287
Violin player *216
Vises for small screws *71

W

Wassermann-Ehrlich researches, 282, 283
WARSHIPS.
—Annual increase necessary 124
—Battle-cruisers for U. S. Navy ..6, 578
—Development of the turret-ships ..*153
—Ear-protectors for gunners *219
—Engines for submarines *500
—Increase in world's fleets 296
—Launching the "Queen Mary" 231
—"Maine" *85, 281, 288
—"Moltke," German battle cruiser, *569, 578
—"Monitor" *153
—"Nevada" *212
—"Oklahoma" *212
—Olympic-Hawke 170, 171, 215, 239
—Sinking of the "Petropavlovsk" 278
—Three-gun turrets *85
—Trial trip of "Florida" *308
—"Warrington," accident 61, *65
—White, William, naval architect ..*499
—See also Naval Affairs.—Ordnance.
WASTE UTILIZATION.
—In Germany 534, 562
—In gas manufacture 534
—Of dead timber *537
—Packing house by-products *538
—Smoke consumption *539
Water from oil, removing 450
WATER POWER.
—Federal control 232
—In New York State 151
—Largest overshot waterwheel *336
—Million H. P. hydro-electric plant..171
—Principles of development 239
Water, seltzer 286
WATER SUPPLY.
—Controlling water waste *302, *304
—Device for lessening waste *304
—Hydro-electric power in U. S. 491
—Los Angeles aqueduct *469, 476
—Standpipe failure 171
—St. Petersburg's sterilizing plant..*268
—Thawing water main *269
—See also Sanitary Engineering.
Water pipes, thawing 233
Weather Service. See Meteorology.
Wells, blowing and sucking 242
Weisbach, Carl Auer von *327
Westinghouse air-spring *160
Westinghouse, George *577, 582
Weston, Edward *312
Wharve timbers, preservation *403
Wheels, grinding, safety appliances..*90
Wheels, grinding, making 270, *271
White, Sir William *499
Willow tree freak *271
Wiley, Harvey W. 282
Window shade, adjustable *450
Winds, trade 49
WIRELESS TELEGRAPHY.
—Amateur interference 399, 447, 516, 563
—Around the world 63
—Cipher code 238
—Eiffer time signals 437
—From a bicycle *91
—Government regulation, 261, 266, 282, 329, 531
—Guiding aviation in Sahara 325
—In Uraguay 375, 378
—International convention 531
—Navy stations around the world ..*360
—Shortcomings at sea 510
—Stations run by wind mills 175
—Time signals 65
—Tuning stations 371
—Uniform nomenclature 471
—Weather reports 49, 448
—Without antennas 128
"Wise eyes of Robin" 205
Wood-borer destroyed by electricty..*403
Wood, most expensive 444
Woods, commercial 226
Workshop suggestions, 71, 111, 270, 237, 423, *567
Winds shake the earth 558
Wrench, spanner, adjustable *71
Wrench, universal *71
Wright, Wilbur 471, *518, 559
Wright aeroplane patents..221, 287, 563

Z

Zapote tree as a source of chicle 428